Musculoskeletal injuries are a substantial problem in racehorses. Lameness in racehorses is the leading cause of training failure, racehorse wastage, and turnover, with non-fatal musculoskeletal injuries occurring in 2.2-3.3 horses/per 1000 starts—this does not include injuries that occur during training. Fatal musculoskeletal injury (FMSI) rates of 1.2-1.7/1000 starts have been reported in Thoroughbred horses racing in North America and account for 70-80% of all deaths that occur at racetracks. Therefore, musculoskeletal injuries have a significant impact on the racing industry due to concerns over horse welfare, jockey safety, economic loss, and the negative impact that these injuries have on the public perception of the sport. Multiple epidemiological studies have been performed to identify risk factors for musculoskeletal injuries in racehorses, and as can be expected many of these studies have conflicting results. However, multiple studies have identified the following risk factors for developing FMSIs: horse characteristics (age ≥ 4 years, males, pre-existing suspensory desmitis, toe grabs > 2mm high, under-run heels, having lameness detected on pre-race veterinary inspection); racing and training characteristics (increased race length, increased field size, claiming races, recent lay-up, and recent increase or decrease in training intensity); and track surface characteristics (firm footing, inconsistent footing, surface type).

When comparing racing surfaces worldwide, flat races run on turf have the lowest FMSI rates (0.38-0.57/1000 starts), followed by synthetic (aka “all-weather”) surfaces (0.72-1.47/1000 starts), and then dirt surfaces (1.7-2.03/1000 starts). Though the actual numbers do vary, almost all studies have found this relationship of injury rate and surface type to be consistent. However, closer inspection of the results from different studies shows that while the FMSI rate of turf courses worldwide is fairly consistent, those of synthetic and dirt surfaces have more variation. It appears that synthetic surfaces have a very low FMSI rate for the first few years after their construction, with the FMSI rate decreasing by as much as 65% for the first meet after the change from dirt to a synthetic surface. However, as time goes on the FMSI rates on synthetic surfaces appears to increase, although they still remain below those of dirt surfaces. Recent data from the Jockey Club shows that overall, tracks that have changed from a dirt surface to a synthetic one have decreased the FMSI rate by 28%. This attrition has been suggested to be due to breakdown of the oils and waxes that are used to coat the synthetic surfaces, causing them to be less effective at draining water from the surface of the track down to the deeper layers of the surface. Additionally, breakdown of these substances also appears to make the synthetic surfaces more sensitive to changes in temperature. The FMSI rate of dirt surfaces also varies from track to track, which is proposed to be due to track maintenance issues such as providing adequate drainage and maintaining a consistent surface. And while it appears that synthetic surfaces are safer than dirt, it should be noted that when synthetic surfaces have replaced turf courses the FMSI rates have increased, again suggesting that overall turf courses appear to be the safest surface type.

In addition to the differences in the FMSI rates between racing surfaces, the types of musculoskeletal injuries seen in horses training and racing on different surfaces also varies. Horses training on dirt tracks are at an increased risk of developing dorsal metacarpal disease when compared to those training on turf or wood chip tracks. Lateral condylar fractures of MC/MT3
are the most common type of FMSI seen in horses racing on dirt or turf tracks, whereas biaxial sesamoid fractures are the most common FMSI seen in horses racing on synthetic surfaces.\textsuperscript{11,15}

Orthopedic injuries in horses can be difficult to treat, largely due to the patient size and the potential to develop contralateral limb laminitis if comfort of the injured leg is not quickly restored. However, there are many injuries that are non fatal and can be treated if prompt first aid is administered. If surgery is an option (or if there is the possibility that it may be) is imperative that the injured limb is stabilized as quickly as possible – preferably while on the track. This can prevent a closed injury from becoming an open fracture and will dramatically increase the patient’s comfort / decrease their stress in the acute situation. The horse should be stopped from moving as soon as possible, and the appropriate coaptation applied.\textsuperscript{20} Sedation should be administered as needed to keep the horse calm while this is being applied. Once this is done the horse can be safely moved back to the barn where radiographs or other diagnostics can be performed. Some fractures can be repaired, and many horses can return to athletic performance post repair. Examples of these include carpal chip or slab fractures, fetlock condylar fractures, some sesamoid bone fractures, and some pastern fractures. Other injuries can be repaired but the horse will have limited athletic function upon healing – many of these horses can become pasture sound or sound enough for to be used for breeding. These injuries include severe condyral fractures of the fetlock region, comminuted fractures of pastern or P1, biaxial sesamoid fractures, and rupture of the suspensory apparatus (suspensory ligament or distal sesamoidean ligaments). More severe injuries cannot be repaired – these would include most open fractures, mid cannon bone fractures, and fractures of the radius, tibia and femur. Pelvic fractures can cause severe lameness initially but depending on the configuration some of these can heal – nuclear scintigraphy is indicated in these cases to determine the configuration and any involvement with the hip joint, which would indicate a poor prognosis.

Race horse injuries are multifactorial, and can range from mild chip fractures to FMSIs. Prompt first aid, stabilization of the limb and quickly establishing a diagnosis are imperative if a successful outcome is to be achieved for those conditions that are amenable to surgery. Knowing which injuries can be treated and how to correctly stabilize an injured limb are the keys to successful patient management in the acute situation.

References: